

**Problem H**

For the Born approximation for scattering from a weak soft-sphere potential

$$V(\mathbf{r}) = \begin{cases} V_0 & r < a \\ 0 & r > a, \end{cases}$$

(see Problem 11.10), plot  $D(\theta)$  versus  $\theta$  for the following range of energies:  $ka = 0.1, 0.3, 1, 3, 10$ . Put the plots on the same graph, and for convenience, set  $mV_0a^3/\hbar^2 = 1$  (this corresponds to a choice of length scale).

**Problem I**

Show that the Born series summed to all orders converges to the exact solution to the integral Schrödinger Equation. *Hint:* use notation as in Eq. 11.101, and use the sum of a geometric series as a guide.